



# Air Force Research Laboratory|AFRL

*Science and Technology for Tomorrow's Air and Space Force*

## **Success Story**

### **SPACE SHUTTLE RELEASES TWO PICO SATELLITES**



Scientists and engineers at the Information Directorate, using funding from the Defense Advanced Research Projects Agency of Arlington, Virginia, developed the microelectromechanical systems (MEMS)-based pico satellite (PICOSAT) inspector (MEPSI) experiment. MEPSI is a significant step forward in the development of an onboard autonomous inspection capability.

The miniature self-inspection system provides decision makers with a rapid feedback capability for detection and response to spacecraft anomalies for maintaining ultimate satellite longevity. Directorate engineers can develop the miniature self-inspection system for a particular space system or for carrying aboard virtually any host vehicle.



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### **Accomplishment**

In December 2002, the Space Shuttle Endeavor, enroute from the International Space Station, successfully released two PICOSATs from a specialized spring-loaded launcher assembly mounted on the sidewall of the space shuttle. They weighed slightly less than 2 lbs each.

The PICOSAT is the smallest functional satellite in the world and the smallest satellite payload ever carried on the space shuttle. PICOSATs will eventually orbit near a spacecraft to monitor for maintenance and failure detection or perhaps to serve as a protection against natural or man-made threats to the spacecraft.

These small satellites will independently monitor the status of the spacecraft and communicate that data directly to earth. The shuttle deployment was the latest in a series of experiments that will lead to demonstrating these taskable miniaturized autonomous spacecraft companions.

### **Background**

Objectives of the mission include demonstration of a launcher assembly approved for use in the shuttle cargo bay, establishment of communications and data exchange between the two PICOSATs and the ground station, exercise of onboard MEMS inertial measurement system, and improved transmitting power. Directorate researchers envision MEPSI to enhance satellite command and control operations by providing active, onboard imaging capability to assess spacecraft damage, monitor launch and deployment sequences, and augment servicing operations.

Information  
Technology Transfer

### **Additional information**

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (03-IF-04)